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XI

PRELIMINARY DESCRIPTIONS OF NEW SPECIES
OF PULMONATA OF THE GALAPAGOS ISLANDS

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A full discussion of, and report upon, the collection of landshells and Tertiary fossils collected by Mr. W. H. Ochsner has been prepared and submitted for publication. But the publication seeming likely to be delayed, it was thought best to print diagnoses of the new species in order that the credit due to the collector and to the Academy might not be diminished by later researches carried on by other agencies.

The types of these new forms form part of the Academy's collection; cotypes have been deposited in the collection of the U. S. National Museum at Washington.

It is expected that when the complete report is issued the species will be suitably figured, and that report contains a full discussion of their relations to other previously described species and to the conditions under which they live.

The descriptions of the new species of fossils are less likely to be anticipated and are therefore left for appearance in the final report.

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1. *Bulimulus (Næsiotus) elæodes*, new species

Shell small, ovate-conic, with six whorls separated by a well marked suture, the nucleus strongly striated, the apex dimpled, thin, fragile, with low feeble wrinkles, sometimes strong on the base; color oily white, with irregular brownish axial streaks, and a concentration of reddish brown in a narrow space in front of the suture and on the pillar; aperture less than half as long as the shell, body without enamel, outer lip very thin and sharp, pillar thin, short, straight with a slight reflexion over a narrowly perforate umbilicus. Length of shell 13.5 ; of last whorl 6.5 ; diameter 7.0 mm.

Albemarle Island, on leaves, hibernating, at 1500 to 2300 feet elevation, near Banks Bay; Ochsner.

2. *Bulimulus (Næsiotus) hemærodes*, new species

Shell small, livid pinkish brown, of five and a half whorls; the apex dimpled, the nuclear whorls distinctly transversely minutely ribbed; surface of spire polished, with microscopic spiral striation not beaded; the transverse sculpture varying in individuals from faint incremental lines to regular narrow riblets or irregular ridges; on the last whorl especially the most extremely rugose sculpture has a worm-eaten appearance, while in other individuals the rugosities may be minute and regular, or deferred to the last quarter of a whorl. Normal specimens show a pale, narrow peripheral band, but in very rugose individuals this is lost; the last whorl, especially when very rough, is whiter than the rest of the shell; margin of the aperture thin, sharp, the outer lip not reflected, the umbilicus a narrow perforation; the axis continuously tubular, simple, not twisted. Length of shell 12 . ; of last whorl 9 ; diameter 7 mm.

Hibernating under dead wood on Cowley Mountain, Albemarle Island, between 2100 and 2300 feet elevation, in the grassy zone; and hibernating on the grassy rim of the crater of Narborough up to 4500 feet; Ochsner.

3. *Bulimulus (Næsiotus) perrus*, new species

Shell small, shiny, ruddy brown, a narrow pale area in front of the suture; apex blunt, dimpled nucleus faintly

transversely striated; whorls rounded with a deep suture; sculpture of rather irregular feeble axial wrinkles, stronger on the last whorl; base rounded, with a minute umbilical perforation; aperture with a thin sharp, not reflected margin; pillar short, reflected over the umbilical perforation; there are a few obscure spirals on the upper whorls, but no distinct or regular spiral striation. Length of shell 12.0 ; of last whorl 8.0 ; of aperture 5.5 ; diameter 6.0 mm.

Narborough Island, in the grassy area at the rim of the crater, 2000 to 4500 feet elevation; Ochsner.

4. *Bulimulus* (*Næsiotus*) *cucullinus*, new species

Shell with a dimpled apex of livid slate-color, two strongly transversely striated nuclear whorls and about four subsequent moderately convex whorls separated by a distinct but not deep suture; color of the shell grayish white, covered by an olivaceous brown periostracum, smooth but not lustrous; sculpture only of inconspicuous incremental axial lines, more or less irregularly disposed; base produced, with a very narrow umbilical perforation largely covered by the reflected inner lip; aperture subovate, the margin callous, expanded and almost reflected; the pillar and outer lips united across the body by a thin layer of vitreous enamel, the rest of the margin of the aperture conspicuously white, the throat livid. Length of shell 19 ; of last whorl 12 ; of aperture 9 ; diameter 9.5 mm.

Found by Mr. Ochsner on Hood Island hibernating under stones between 200 and 600 feet elevation; a variety with faint indications of a peripheral band, with the others and also on Charles Island in the moist area under moss and grass at 1650 feet; and on Barrington Island under stones in hibernation at 200 feet; lastly a paler variety on Hood Island at 380 feet elevation.

5. *Bulimulus* (*Næsiotus*) *albemarlensis*, new species

Shell of the general aspect of *tortuganus* but larger; solid, stout, inflated, short-spined, with six rapidly increasing whorls; apex dimpled, nuclear whorls small, transversely

striated; sculpture of upper whorls of retractively inclined close-set rather vermiculate axial wrinkles crossed by numerous fine sharp spiral striæ; in some specimens this sculpture covers the whole shell but in most the last whorl becomes rudely and irregularly coarsely wrinkled and punctate to a greater or less extent; the normal sculpture retains the pinkish light brown color which follows the rose pink of the apical turns, but when the abnormal wrinkling begins the surface becomes of a dirty white color; a pale peripheral band on the last whorl is preserved in most specimens; the suture is deep but not channelled; the base rounded, with an almost imperforate umbilical pit partly covered in the adult by the reflexion of the pillar lip; aperture subquadrate, the margin thickened but the outer lip not reflected, showing a slight thickening in fully adult specimens on its inner side medially; the pillar has a thick lump of white callus upon it, and is joined to the outer lip over the body by a deposit of enamel; the throat is of a dark flesh-color. Length of shell 15 ; of last whorl 12 ; of aperture 8 ; diameter 9 mm.

On bushes and grass near Villamil at 2300 to 3300 feet elevation; Ochsner.

6. *Bulimulus* (*Næsiotus*) *akamatus*, new species

Shell solid, chocolate brown, of six and a half whorls; apex dimpled, dark crimson, nuclear whorls transversely striated; sculpture of rather irregular moderately prominent incremental lines, except on the last half of the last whorl which is irregularly malleated and indented the whole crossed by very faint and minute spiral striæ; suture distinct, not deep, base rounded with a rather wide subcylindric umbilical perforation; aperture small with a continuous, thickened, not reflected margin; callosities white, that on the pillar continued halfway through the last whorl, diminishing around the axis; the medial thickening of the outer lip is also continued backward some distance, as is a very prominent narrow tubercle on the body between the two lips; the upper part of the axis is slender and simple. Length of shell 15 ; of last whorl 10 ; of aperture 5.5 ; diameter 8 mm.

Found by Ochsner on Indefatigable Island, under blocks of lava, at 200 to 650 feet elevation, in the arid zone.

7. *Bulimulus (Næsiotus) adelphus*, new species

Shell of the same general type as the preceding from which it is best distinguished by a differential diagnosis: it is of a light or very pale yellowish brown with a paler peripheral band, six whorls, retractively, closely, axially threaded, the threads cut into granules by sharp spiral striæ, the last half of the last whorl irregularly corrugated; the axial perforation larger, the aperture subquadrate with continuous margin thickened but not reflected, a large tubercle on the pillar, a prominent one medially on the inside of the outer lip, a much smaller one on the body deeper in the throat; the axis is simple, tubular and not twisted. Length of shell 14.5 ; of last whorl 10.0 ; of aperture 5.5 ; diameter 9 mm.

Found with the preceding species by Ochsner in the arid zone.

8. *Bulimulus (Næsiotus) lycodus*, new species

Shell small, solid, subacute, white, or yellowish white, with a rose pink or bluish apex and six rapidly enlarging whorls; upper whorls finely, retractively, axially, closely threaded, with fine spiral striation, the suture appressed; last whorl very coarsely, irregularly corrugated and punctate; base rounded with a narrow umbilical perforation; aperture with a thick continuous white margin slightly expanded but not reflected; the mesial thickening of the outer lip obsolete, perceptible in only a few specimens; pillar with a very anterior strong anteriorly inclined tubercle, continued into the throat as a diminishing ridge around the axis of the last whorl; on the body is a sharp prominent narrow tooth also prolonged backward as a narrow ridge; axis in the upper whorls very slender and conspicuously twisted. Length of shell 11 ; of last whorl 8 ; of aperture 4.5 ; diameter 8 mm.

Found by Ochsner on Indefatigable Island on tree trunks at 450 to 550 feet elevation.

9. *Bulimulus (Næsiotus) alethorhytidus*, new species

Shell small, resembling the preceding but with the prominent characters exaggerated and the size much reduced; whorls five, rapidly enlarging, nucleus sparsely transversely minutely lamellose, dimpled, the first three whorls rather

irregularly retractively axially finely wrinkled; last two coarsely irregularly strongly wrinkled all over; umbilicus minutely perforate, base rounded; aperture small, contracted, thickened, with continuous not reflected margin; pillar and body with prominent tubercles, that on the pillar continued backward into the penultimate whorl as an obscure plait, that on the body also continued for a shorter distance in the last whorl, the axis in the earlier whorls slender, perforate. Length of shell 8.0 ; of last whorl 5.5 ; of aperture 3.5 ; diameter 5.5 mm.

Indefatigable Island, in the moist area on the south side at 350 to 400 feet, and at all altitudes in the interior; Ochsner.

10. *Bulimulus (Næsiotus) cymatias*, new species

Shell small, solid, uniform yellowish brown, with nearly seven whorls, rapidly enlarging; surface uniformly sculptured with slightly irregular retractive narrow, close-set wrinkles crossed by extremely fine spiral threads of which at regular intervals one is more prominent than the rest; near the aperture are some irregular rugosities or indentations in some specimens but no change of color; there is a narrow inconspicuous pale peripheral band ending behind the median tubercle of the outer lip; base rounded, umbilicus narrowly perforate; aperture with a continuous thickened margin, a well defined tubercle inside the outer lip, a strong tooth anteriorly on the pillar, and one on the body; both these are continued into the shell, the one on the pillar as a strongly undulated ridge which extends, diminishing into the penultimate whorl, while the parietal tooth also extends inward about half a whorl, but less distinctly undulated and rapidly diminishing; the tubercle on the outer lip is hardly extended. Length of shell 14 ; of last whorl 8 ; of aperture 5 ; diameter 8 mm.

Indefatigable Island, under lava blocks in a moist area between 400 and 650 feet elevation; Ochsner.

11. *Bulimulus (Næsiotus) ochsneri*, new species

Shell chocolate brown, with no indications of a peripheral band, solid, stout, with six and a half whorls; apex dimpled, closely transversely sculptured, tinged with deep carmine;

sculpture of the upper whorls much like that in *B. cymatias* but the spiral sculpture more or less broken into dots; last half of the last whorl with the surface irregularly coarsely corrugated, but with no change of color; suture distinct, not appressed; aperture with a thickened white, not reflected, continuous margin; umbilical perforation small; outer lip straight, not reinforced in the middle by any ridge or tubercle; pillar with a large shapeless tubercle on the middle which is not produced backward into the whorl; body with a small tubercle moderately produced inward in a feeble way; axis of the upper whorls, simple tubular. Length of shell 17.5 ; of last whorl 13.0 ; of aperture 8.0 ; diameter 10.0 mm.

Indefatigable Island, under lava blocks at 200 to 650 feet altitude; Ochsner.

12. *Bulimulus (Næsiotus) jervisensis*, new species

Shell rude, showing remnants of a brown periostracum, short-conic, with five and a half whorls; nucleus crimson, dimpled, transversely irregularly feebly wrinkled; the last one irregularly more or less corrugated; spiral sculpture of fine sharp close-set striæ over the whole shell; aperture slightly thickened at the margin, not reflected, the pillar and outer lips united by a layer of enamel on the body; umbilical perforation very small; an obscure small tubercle on the body, and in most specimens a slight ill-defined thickening on the pillar; axis slightly twisted, very slender in the upper whorls. Length of shell 17 ; of last whorl 13.5 ; of aperture 9 ; diameter 11 mm.

A few dead specimens were collected on Jervis Island at an elevation of 900 to 1000 feet, by Mr. Ochsner.

13. *Bulimulus (Næsiotus) rabidensis*, new species

Shell rather elongate, its profile more cylindrical than in *sculpturatus*, thin, of about seven slightly convex whorls, separated by a distinct, not appressed, suture; apex dimpled, nucleus transversely minutely ribbed; the next two or three whorls sharply closely spirally threaded, the threads slightly pustular when they cross axial irregularities; the subsequent whorls irregularly subaxially rugose with low broken ridges, increasing in number and strength toward the aperture; the

spirals continue to the aperture; the color of the last whorl dirty white, the earlier whorls dull flesh color, the apex usually pale, and in rare instances a pale peripheral band is present; umbilical perforation minute; aperture with a thickened not reflected, continuous margin, the pillar and body as well as the outer lip without projecting callosities; the axis very slender and distinctly twisted, probably not tubular. Length of shell 15.5 ; of last whorl 9.0 ; of aperture 5.5 ; diameter 7.0 mm.

Obtained by Mr. Ochsner in "a fairly dry" region on Jarvis (or Rabida) Island, at an altitude of 900 to 1000 feet.

14. *Helicina* (*Idesa*) *ochsneri*, new species

Shell much resembling *H. nesiotica* in a general way but higher, more conical and slightly larger; while *nesiotica* has a thin smooth periostracum and the specimens are clean when living, the present species has a blackish periostracum which is raised on the spire between the sutures into two or three fringed short spiral threads. The periostracum appears to be of an adhesive nature and all the specimens in their original condition are more or less covered with a blackish coating. When this is cleaned off the underlying shell has much the coloration and surface of *nesiotica*. Maximum diameter of shell 4.7 ; height 3.5 mm.

Albamarle Island, eight miles west of Turtle Cove, near salt lagoon; and at Cowley Mountain on moist ground, 350 to 500 feet above the sea; Ochsner.

15. *Williamia galapagana* Dall.

Shell small, ovate, conical, the apex curved forward and situated at about the anterior third of the length; surface probably with a thin periostracum when fresh, but in all specimens seen this has been lost and the surface is brilliantly polished; the color is of a rosy brown with numerous paler radial streaks; margin simple, often slightly irregular from adapting itself to the sustaining surface; muscular scar interrupted as usual in the family. Length 9.0 ; height 3.5 ; breadth 7.0 mm.

Station on floating seaweed at the Galapagos Islands; specimens collected on the beach at Hood and Chatham Islands.